REMARKS

DETAILED ACTION Specification

1. The disclosure is objected to because of the following informalities: The Brief Description of the Drawings starts at Figure 3.

Appropriate correction is required.

Applicant has amended the specification herein to include reference to Figures 1a-1d and 2 as prior art.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Long)*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Omum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321 (c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-8 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6, 8-10, 12,13 and 15-19 of U.S.

Patent No. 6662812 B1. Although the conflicting claims are not identical, they are not patentably distinct from each other because both teach a method of printing solder and cleaning the stencil by wiping and applying vibrational energy (instant claims 1 and 4 and '812 claims 6,10,12 and 15). However the terminology is slightly different and there is no disclosure of ultrasonic vibration. Fluid is applied to the paper used in the process and vacuum is applied (instant claims 3-7 and '812 claims 8, 9 and 16-19).

It would have been obvious to one of ordinary skill in the art at the time of the invention that the target is the circuit board and that the printable medium is solder. Ultrasonic vibration is well known and conventional in the art for both cleaning and solder sphere placement.

Applicant has cancelled claims 1-20 and introduced new claims 21-40.

Claims 21-40 are directed towards specifically drying of various items related to electronics assembly which are wet by the application of a fluid for cleaning. Applicant believes the claims are narrower and therefore patentably distinct from the set of '812 issued claims.

4. Claims 8, 10-13 and 15-18 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 13 and 19 of U.S. Patent No. 6138562. Although the conflicting claims are not identical, they are not patentably distinct from each other because both teach an apparatus comprising mechanisms for aligning a stencil, placing solder, cleaning the stencil and vibration

which may be used for placing solder or cleaning the stencil. Both teach vibrating through a medium (not air). It is noted that the object or substrate does not further limit the apparatus. However the terminology is slightly different.

It would have been obvious to one of ordinary skill in the art at the time of the invention that the vibrational energy can be used for a variety of purposes and that vibrational waves that are not air must be passed through a medium.

Applicant has cancelled claims 1-20 and introduced new claims 21-40.

Claims 21-40 are directed towards specifically drying of various items related to electronics assembly which are wet by the application of a fluid for cleaning, an element that was not taught / claimed in the '562 patent. Applicant believes the claims include new matter from the '562 patent and therefore patentably distinct from the set of '562 issued claims.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351 (a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. The Examiner has rejected Claims 8, 9, 13, 14 and 18 under 35 U.S.C. 102(b) as being anticipated by Ray (USPN 5407488).

Ray teaches a stencil apparatus, a squeegee for placing solder which can be used for cleaning (col 2 lines 28-61) in addition to vibration means (col 3 lines 4-15 and lines 29-36).

Applicant has cancelled claims 1-20 and introduced new claims 21-40.

Claims 21-40 are directed towards specifically drying of various items related to electronics assembly which are wet by the application of a fluid for cleaning.

Ray fails to teach the application of using vibrational energy for drying of stencils.

Applicant believes that Ray has been overcome with the introduction of the new claims 21-40.

7. Claims 1-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Asai et al. (USPN 5988060).

Asai teaches an apparatus and method of cleaning a stencil after screen printing (col 16 lines 35-50) by wiping with wet paper (col 28 lines 51-67 and col 41 lines 25-35) and applying ultrasonic vibration through air (col 26 line 58 - col 27 line 10) and the washing fluid. Fluid and vacuum are applied (col 27 lines 11-52 and col 37 lines 8-27). The apparatus comprises mechanisms for aligning areas, placing solder, cleaning the stencil and applying vibrational energy through air or a fluid medium (col 16 lines 35-50 and col 26 line 58 - col 3 line 65).

Applicant has cancelled claims 1-20 and introduced new claims 21-40.

Claims 21-40 are directed towards specifically drying of various items related to electronics assembly which are wet by the application of a fluid for cleaning.

Asai fails to teach the application of using vibrational energy for drying of stencils.

Applicant believes that Asai has been overcome with the introduction of the new claims 21-40. Applicant has added new claims to improve coverage of the existing '812 Patent based upon the newly found art, Asai.

CONCLUSIONS

Applicants believe the amendments and remarks herein provide a complete response to the Office Action mailed on February 18, 2005. The Examiner has established a shortened statutory period of three (3) months for response to the Office Action. Applicants have responded to the Office Action on or before May 18, 2005 with

a proper certificate of correspondence. Therefore, the Applicants believe the response is timely and no additional fees are required.

The present application, after entry of this amendment, comprises twenty (20) claims, including three (3) independent claims. Applicant has paid for twenty (20) claims, including three (3) independent claims. Applicant, therefore, believes that no additional fee respective to claims is currently due.

If the Examiner believes that there are any informalities that can be corrected by Examiner's amendment, a telephone call to the Applicant (Allen Hertz) at (561) 883-0115 (Office)(Please leave a message) or (561) 716-3915 (Cell phone) is respectfully solicited.

Respectfully submitted,

Allen D. Hertz

Applicant, Agent of Record,

Registration Number: 50,942

Please submit all correspondence concerning this patent application to:

Allen D. Hertz
Registration Number: 50,942

Customer Number: 31877
12784 Tulipwood Circle
Boca Raton, Florida 33428
Tel: 561/883-0115
Cell: 561/716-3915
Fax: 561/883-0115

The present invention discloses the application of acoustic pressure waves and resulting vibrational energy to atomize excess moisture and entrapped moisture in hard to reach cracks and crevices, thus overcoming the surface tensional forces and allowing increased efficiency of the hot air dryers and the infrared heaters. The acoustic pressure waves, generated by a transducer and transferred to the module through the air, will impinge the module at the angle prescribed and not be substantially affected by the volume or velocity of the hot air flow caused by the hot air dryers.

The present inventions further discloses the application of vibrational energy through close proximity to dry preferably planar tooling such as stencils where heat is not desirable.

The present invention further combines the enhancements of the print release portion of the present invention, the cleaning portion of the present invention, and the drying portion of the present invention. The combination of at least two of the contributors directs a method and apparatus forward for utilizing screen printing technology for applying solder bumps to IC Die or wafers, resulting in a repeatable, low cost solution.

Brief Description of the Drawings

FIG. 1a through 1d describes the prior art, presenting the features for screen printing solder paste, and the like, onto a printed circuit assembly, integrated circuit wafer, and the like.

FIG. 2 teaches the limitations of the prior art, describing an aspect of the.

FIG. 3 is a flow diagram showing the steps of the print release portion of the present invention.

FIG. 4 is a perspective view of a stencil showing a single aperture above an object and the desirable location for deposition of a material.

FIG. 5 is a cross sectional view that illustrates the forces exerted on the material during the preferred process to separate a stencil and an object.

FIG. 6 is a cross sectional drawing which illustrates two preferred methods of transferring the vibrational forces to the material and stencil to assist in the release process.

FIG. 7 is an isometric view of a test stencil used to validate the present invention.

FIG. 8 is a cross sectional view of a deposition of solder paste onto a receiving pad illustrating the advantages found during experimentation of the present invention.

FIG. 9 is a sectional side view of a stencil cleaner in the drying cycle in conjunction with the use of ultrasonic transducers.

FIG. 10 is a sectional side view of a solder stencil cleaning apparatus using vibrational energy for cleaning and drying.

FIG. 11 is a sectional side view of a solder stencil in conjunction with an under wiping system with the use of an ultrasonic transducer for drying.